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-	51	((bus$2 and collision$1 and (queue$1 or fifo$1) and database$1 and librar$3 and (simulat$4 or model$1) and (ic$1 or circuit$1)) and @ad<20001106) and (database$1 same librar$4)	USPAT; US-PGPUB; EPO; JPO; IBM_TDB	2003/12/22 20:22

Terms used
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1 Contents of the Computer Communication Review 1970–1994
David Oran
January 1995 **ACM SIGCOMM Computer Communication Review**, Volume 25 Issue 1
Full text available: pdf(1.75 MB) Additional Information: full citation, index terms

2 An extensible object-oriented mixed-mod functional simulation system
Richard H. Lathrop, Robert S. Kirk
June 1985 **Proceedings of the 22nd ACM/IEEE conference on Design automation**
Full text available: pdf(936.09 KB) Additional Information: full citation, abstract, references, citings, index terms

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3 A hierarchical modeling framework for on-chip communication architectures
Xinping Zhu, Sharad Malik
November 2002 **Proceedings of the 2002 IEEE/ACM international conference on Computer-aided design**
Full text available: pdf(124.52 KB) Additional Information: full citation, abstract, references, citings, index terms

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June 1991 **ACM C mputing Surveys (CSUR)**, Volume 23 Issue 2

Full text available: pdf(3.83 MB) Additional Information: full citation, abstract, references, citings, index terms, review

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Keywords: access schemes, computer networks, data communication, medium access protocols, optical fiber networks

5 Computer simulation of communications on the space station data management system

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6 IRIS performer: a high performance multiprocessing toolkit for real-time 3D graphics

John Rohlf, James Helman

July 1994 **Proceedings of the 21st annual conference on Computer graphics and interactive techniques**

Full text available: pdf(633.11 KB) ps(9.32 MB) Additional Information: full citation, abstract, references, citings, index terms

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8 A parallel processor architecture for graphics arithmetic operations

John G. Torborg

August 1987 **ACM SIGGRAPH C mputer Graphics , Proceedings of the 14th annual c nference n C mputer graphics and interactive techniques**, Volume 21 Issue 4

Full text available: pdf(1.18 MB) Additional Information: full citation, references, citings, index terms

9 Using channel state dependent packet scheduling to improve TCP throughput over wireless LANs

Pravin Bhagwat, Partha Bhattacharya, Arvind Krishma, Satish K. Tripathi
March 1997 **Wireless Networks**, Volume 3 Issue 1

Full text available: pdf(541.97 KB) Additional Information: full citation, abstract, references, citings, index terms

In recent years, a variety of mobile computers equipped with wireless communication devices have become popular. These computers use applications and protocols, originally developed for wired desktop hosts, to communicate over wireless channels. Unlike wired networks, packets transmitted on wireless channels are often subject to burst errors which cause back to back packet losses. In this paper we study the effect of burst packet errors and error recovery mechanisms employed in wireless MAC ...

10 MemorIES: a programmable, real-time hardware emulation tool for multiprocessor server design

Ashwini Nanda, Kwok-Ken Mak, Krishnan Sugavanam, Ramendra K. Sahoo, Vijayaraghavan Soundararajan, T. Basil Smith
November 2000 **ACM SIGPLAN Notices**, Volume 35 Issue 11

Full text available: pdf(1.84 MB) Additional Information: full citation, abstract, references, index terms

Modern system design often requires multiple levels of simulation for design validation and performance debugging. However, while machines have gotten faster, and simulators have become more detailed, simulation speeds have not tracked machine speeds. As a result, it is difficult to simulate realistic problem sizes and hardware configurations for a target machine. Instead, researchers have focussed on developing scaling methodologies and running smaller problem sizes and configurations that atte ...

11 IS '97: model curriculum and guidelines for undergraduate degree programs in information systems

Gordon B. Davis, John T. Gorgone, J. Daniel Couger, David L. Feinstein, Herbert E. Longenecker
December 1997 **ACM SIGMIS Database , Guidelines for undergraduate degree programs on Model curriculum and guidelines for undergraduate degree programs in information systems**, Volume 28 Issue 1

Full text available: pdf(7.24 MB) Additional Information: full citation, citings

12 Practical byzantine fault tolerance and proactive recovery

Miguel Castro, Barbara Liskov
November 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 4

Full text available: pdf(1.63 MB) Additional Information: full citation, abstract, references, index terms, review

Our growing reliance on online services accessible on the Internet demands highly available systems that provide correct service without interruptions. Software bugs, operator mistakes, and malicious attacks are a major cause of service interruptions and they can cause arbitrary behavior, that is, Byzantine faults. This article describes a new replication algorithm, BFT, that can be used to build highly available systems that tolerate Byzantine faults. BFT can be used in practice to implement re ...

Keywords: Byzantine fault tolerance, asynchronous systems, proactive recovery, state machine replication, state transfer

13 Balancing push and pull for data broadcast

Swarup Acharya, Michael Franklin, Stanley Zdonik

June 1997 **ACM SIGMOD Record , Proceedings of the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2

Full text available: pdf(1.79 MB) Additional Information: full citation, abstract, references, citings, index terms

The increasing ability to interconnect computers through internet-working, wireless networks, high-bandwidth satellite, and cable networks has spawned a new class of information-centered applications based on data dissemination. These applications employ broadcast to deliver data to very large client populations. We have proposed the Broadcast Disks paradigm [Zdon94, Acha95b] for organizing the contents of a data broadcast program and for managing client resources in respon ...

14 A framework for the performance analysis of concurrent B-tree algorithms

Theodore Johnson, Dennis Shasha

April 1990 **Proceedings of the ninth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**

Full text available: pdf(1.46 MB) Additional Information: full citation, abstract, references, citings, index terms

Many concurrent B-tree algorithms have been proposed, but they have not yet been satisfactorily analyzed. When transaction processing systems require high levels of concurrency, a restrictive serialization technique on the B-tree index can cause a bottleneck. In this paper, we present a framework for constructing analytical performance models of concurrent B-tree algorithms. The models can predict the response time and maximum throughput. We analyze three algorithms: Naive Lock-coupling, Op ...

15 U-Net: a user-level network interface for parallel and distributed computing (includes URL)

T. von Eicken, A. Basu, V. Buch, W. Vogels

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5

Full text available: pdf(1.84 MB) Additional Information: full citation, references, citings, index terms

16 Impact of hardware interconnection structures on the performance of decentralized software

Robert J. Souza, Edward E. Balkovich

May 1981 **Proceedings of the 8th annual symposium on Computer Architecture**

Full text available: pdf(505.73 KB) Additional Information: full citation, abstract, references, index terms

The results of an investigation of the relationship between software structure, hardware interconnect structure, and the performance of decentralized computer systems are presented in this paper. Programs written in a language that has the salient features of most languages suggested for decentralized software were analyzed using trace-driven simulation. Results indicate that reasonable performance may be obtained at relatively low bandwidths using typical decentralized interconnect structu ...

17 RASSP virtual prototyping of DSP systems

C. Hein, J. Pridgen, W. Kline

June 1997 **Proceedings of the 34th annual conference on Design automation conference**

Full text available: pdf(128.85 KB) Additional Information: full citation, references, index terms

18 NETWORK II.5 tutorial (tutorial session): network modeling without programming
William J. Garrison
December 1990 **Proceedings of the 22nd conference on Winter simulation**
Full text available: pdf(315.24 KB) Additional Information: full citation, references, index terms

19 A fiber optic hypermesh for SIMD/MIMD machines
Ted Szymanski
November 1990 **Proceedings of the 1990 ACM/IEEE conference on Supercomputing**
Full text available: pdf(1.41 MB) Additional Information: full citation, abstract, references

A fiber optic multidimensional mesh-based network for SIMD and MIMD multiprocessors is proposed. For the basic building block, a novel distributed optical switch is proposed; The switch requires 50 % fewer lasers/receivers than previous WDM optical crossbars and uses a novel random-access scheme which supports prioritized traffic. To implement very large networks using lasers with limited tunability (or electronic crossbars of small degree) we propose arranging switches into a novel *n*-dim ...

20 Simulation modelling support via network based concepts
Stephen C. Mathewson
December 1990 **Proceedings of the 22nd conference on Winter simulation**
Full text available: pdf(953.01 KB) Additional Information: full citation, references, citings, index terms

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James A. Rowson, Alberto Sangiovanni-Vincentelli

June 1997 **Proceedings of the 34th annual conference on Design automation conference**

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2 Design of complex systems with a VHDL based methodology

S. Amadori, P. Coerezza

November 1992 **Proceedings of the conference on European design automation**

Full text available: pdf(525.28 KB) Additional Information: full citation, references, index terms

3 Operating system based software generation for systems-on-chip

Dirk Desmet, D. Verkest, Hugo De Man

June 2000 **Proceedings of the 37th conference on Design automation**

Full text available: pdf(65.66 KB) Additional Information: full citation, abstract, references, citings, index terms

In this paper we propose a system-level design environment, aimed at System-on-Chip (SOC) designs, including real-time embedded software. While many SOC modeling languages originate from hardware description languages, and thus tend to describe statical architectures, we observe that embedded software makes SOC designs essentially dynamic, and so a SOC modeling environment must include dynamic behavior. Such behavior is analogous to the services an Operating System offers in the software wo ...

4 High level and architectural synthesis: An object-oriented design process for system-on-chip using UML

Qiang Zhu, Akio Matsuda, Shinya Kuwamura, Tsuneo Nakata, Minoru Shoji

October 2002 **Proceedings f the 15th internati nal symposium on System Synthesis**

Full text available: pdf(254.87 KB) Additional Information: full citation, abstract, references, citings, index terms

The object-oriented design process has been a hot topic in software development since it will improve product quality and productivity significantly, which is also a major issue in

system-on-chip design. In this paper, a design process is proposed for hardware-software heterogeneous systems by reinforcing parallelism, structure, and timing. The management of design abstraction is also introduced for refinement of hardware. UML is used as a modeling language, and the reinforcement above is gracef ...

Keywords: UML, design process, object-oriented analysis and design, system level design, system level performance evaluation

5 Special Session on Design Paradigms: SystemC: a modeling platform supporting multiple design abstractions

Preeti Ranjan Panda

September 2001 **Proceedings of the 14th international symposium on Systems synthesis**

Full text available: pdf(103.89 KB) Additional Information: full citation, abstract, references, citings, index terms

SystemC is a C++ based modeling platform supporting design abstractions at the register-transfer, behavioral, and system levels. Consisting of a class library and a simulation kernel, the language is an attempt at standardization of a C/C++ design methodology, and is supported by the Open SystemC Initiative (OSCI), a consortium of a wide range of system houses, semiconductor companies, Intellectual property (IP) providers, embedded software developers, and design automation tool vendors. The adv ...

Keywords: C/C++ based design, SystemC, hardware description language, system level design

6 Simulation and verification: A new performance evaluation approach for system level design space exploration

C. P. Joshi, Anshul Kumar, M. Balakrishnan

October 2002 **Proceedings of the 15th international symposium on System Synthesis**

Full text available: pdf(168.41 KB) Additional Information: full citation, abstract, references, index terms

Application specific systems have potential for customization of design with a view to achieve a better cost-performance-power trade-off. Such customization requires extensive design space exploration. In this paper, we introduce a performance evaluation methodology for system-level design exploration that is much faster than traditional cycle-accurate simulation. The trade off is between accuracy and simulation speed. The methodology is based on probabilistic modeling of system components custo ...

Keywords: design space exploration, statistical simulation, system level design

7 Concurrent software system design supported by SARA at the age of one

Ivan M. Campos, Gerald Estrin

May 1978 **Proceedings of the 3rd international conference on Software engineering**

Full text available: pdf(984.11 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper presents a multilevel modeling method suitable for the design of concurrent hardware or software systems. The methodology is requirement driven and uses tools incorporated in a programming system called SARA (Systems ARchitect's Apprentice). Both top down refinement and bottom up abstraction are supported. The design of an asynchronous sender receiver illustrates the key steps in going smoothly from programming in the large to programming in the small or actual code. The same met ...

Keywords: Bottom-up, Concurrent, Software design, Top-down

8 Practical experiences: System-level modeling of a network switch SoC
JoAnn M. Paul, Christopher P. Andrews, Andrew S. Cassidy, Donald E. Thomas
October 2002 **Proceedings of the 15th international symposium on System Synthesis**

Full text available: pdf(176.76 KB) Additional Information: full citation, abstract, references, index terms

We present the modeling of the high-level design of a next generation network switch from the perspective of a Computer-Aided Design (CAD) team within the larger context of a design team consisting of an experienced network switch designer and an experienced VLSI hardware designer. After facilitating the design process, the CAD team observed how designers approach high-level designs, beyond RTL. We motivate the need for CAD support that allows designers to effectively manipulate what we refer to ...

Keywords: computer-aided design, memory visualization level design, network switch, performance modeling, system modeling

9 Software development in a hardware simulation environment
Benny Schnaider, Einat Yogev
June 1996 **Proceedings of the 33rd annual conference on Design automation conference**

Full text available: pdf(42.68 KB) Additional Information: full citation, references, citings, index terms

10 System-level power/performance analysis for embedded systems design
Amit Nandi, Radu Marculescu
June 2001 **Proceedings of the 38th conference on Design automation**

Full text available: pdf(207.21 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper presents a formal technique for system-level power/performance analysis that can help the designer to select the right platform starting from a set of target applications. By platform we mean a family of heterogeneous architectures that satisfy a set of architectural constraints imposed to allow re-use of hardware and software components. More precisely, we introduce the Stochastic Automata Networks (SANs) as an effective formalism for average-case analysis that can be used early ...

Keywords: multimedia systems, platform-based design, stochastic automata networks, system-level analysis

11 Using analytical and simulation modeling for early factory prototyping
Jeanette G. Nymon
December 1987 **Proceedings of the 19th conference on Winter simulation**

Full text available: pdf(282.62 KB) Additional Information: full citation, abstract, citings, index terms

Simulation and modeling needs became apparent early in the design of a Greenfield manufacturing facility, especially in the areas of factory floor design support and in factory floor scheduling. Simulation packages were introduced to this project earlier than normal to help drive the design, rather than waiting for the facility design to drive the system development. Time constraint was another reason for the early development of the prototypes; the models and scheduling systems will be tai ...

12 Advances in system modeling: Transaction level modeling: an overview
Lukai Cai, Daniel Gajski
October 2003 **Proceedings of the 1st IEEE/ACM/IFIP international conference on Hardware/software codesign & system synthesis**
Full text available: pdf(150.94 KB) Additional Information: full citation, abstract, references, index terms

Recently, the transaction-level modeling has been widely referred to in system-level design community. However, the transaction-level models(TLMs) are not well defined and the usage of TLMs in the existing design domains, namely modeling, validation, refinement, exploration, and synthesis, is not well coordinated. This paper introduces a TLM taxonomy and compares the benefits of TLMs' use.

Keywords: exploration, modeling, refinement, synthesis, transaction level model, validation

13 Design-time simulation of a large-scale, distributed object system
Svend Frølund, Pankaj Garg
October 1998 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 8 Issue 4
Full text available: pdf(896.93 KB) Additional Information: full citation, abstract, references, index terms

We present a case study in using simulation at design time to predict the performance and scalability properties of a large-scale distributed object system. The system, called Consul, is a network management system designing to support hundreds of operators managing millions of network devices. It is essential that a system such as Consul be designed with performance and scalability in mind, but due to Consul's complexity and scale, it is hard to reason about performance and scalability us ...

Keywords: distributed object systems design, performance modeling, relative reasoning, scalability analysis

14 From System Specification To Layout: Seamless Top-Down Design Methods for Analog and Mixed-Signal Applications
R. Sommer, I. Rugen-Herzig, E. Hennig, U. Gatti, P. Malcovati, F. Maloberti, K. Einwich, C. Clauss, P. Schwarz, G. Noessing
March 2002 **Proceedings of the conference on Design, automation and test in Europe**
Full text available: pdf(462.49 KB) Publisher Site Additional Information: full citation, abstract

Deisgn automation for analog/mixed-signal (A/MS) circuits and systems is still lagging behind compared to what has been reached in the digital area.As System-on-Chip (SoC) designs include analog components in more cases, these analog parts become even more a bottle neck in the overall design process.The paper is dedicated to latest R&D activities within the MEDEA+ project ANASTASIA+.Main focus will be the development of seamless top-down design methods for integrated analog and misx-signal syste ...

15 Verification, validation and accreditation: Well-defined intended uses: an explicit requirement for accreditation of modeling and simulation applications
Osman Balci, William F. Ormsby
December 2000 **Proceedings of the 32nd conference on Winter simulation**
Full text available: pdf(229.19 KB) Additional Information: full citation, abstract, references, citings

A modeling and simulation (M&S) application is built for a specific purpose and its acceptability assessment is carried out with respect to that purpose. The accreditation

decision for an M&S application is also made with respect to that purpose. The purpose is commonly expressed in terms of "intended uses." The quality of expressing the intended uses significantly affects the quality of the acceptability assessment as well as the quality of making the accreditation decision. The purpose of this ...

16 Simulation hierarchy for microprocessor design

Will Sherwood

February 1977 **Proceedings of the Symposium on Design Automation and Microprocessors**

Full text available: pdf(434.73 KB) Additional Information: full citation, abstract, references, index terms

There are many levels of abstraction through which a designer passes when implementing a microprocessor chip set or system. He usually begins by configuring the application for the microprocessor, bus, and peripherals (memory, etc.). Section at a time, he expands the system components into a Register Transfer level diagram, followed by a detailed chip or gate description. This paper will show how a hierarchical simulator aids each phase in the design by modeling elements at all levels from ...

Keywords: Computer aided design, Gate level, Hierarchical simulation, Microprocessors, PMS, Register transfer level, Software breadboard

17 Improving the aircraft design process using Web-based modeling and simulation

John A. Reed, Gregory J. Follen, Abdollah A. Afjeh

January 2000 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 10 Issue 1

Full text available: pdf(1.06 MB) Additional Information: full citation, abstract, references, index terms

Designing and developing new aircraft systems is time-consuming and expensive. Computational simulation is a promising means for reducing design cycle times, but requires a flexible software environment capable of integrating advanced multidisciplinary and multifidelity analysis methods, dynamically managing data across heterogeneous computing platforms, and distributing computationally complex tasks. Web-based simulation, with its emphasis on collaborative composition of simulation models, ...

Keywords: Java, Web-based simulation, aircraft design, object-oriented

18 Increasing first pass accuracy of AMHS simulation output using legacy data

Scott Wu, John Rayter, Igor Paprotny, Gerald T. Mackulak, Joakim Yngve

December 1999 **Proceedings of the 31st conference on Winter simulation: Simulation---a bridge to the future - Volume 1**

Full text available: pdf(109.21 KB) Additional Information: full citation, references, index terms

19 Special interest group: Use cases in task modeling and user interface design

Larry L. Constantine, Lucy A. D. Lockwood

May 1999 **CHI '99 extended abstracts on Human factors in computer systems**

Full text available: pdf(106.01 KB) Additional Information: full citation, abstract, references

Use cases are increasingly recognized as a particularly versatile form of task model. Use cases are related to scenarios, which have a long history of application to computer-human interaction [2], but may offer distinct advantages. A use case comprises a single case of use of a system that is complete, well-defined, and meaningful from the perspective of an external user [5,8]. Concrete instances of multiple use cases can be combined into plausible sequences to form the narrative vignettes usua ...

Keyw rds: essential models, goal-driven design, model-driven design, scenarios, task modeling, use cases, user intentions

20 How Modeling Methods Affect the Process of Architectural Design Decisions: A Comparative Study

Tetsuo Tamai

March 1996 **Proceedings of the 8th International Workshop on Software Specification and Design**

Full text available: pdf(1.38 MB) Additional Information: full citation, abstract

Publisher Site

A number of modeling methods have been proposed and practiced for the analysis process of software development. As many modeling methods cover the design process as well, it would be natural to ask how those methods affect the critical decisions made during the transition phase from the analysis to the architectural design, but little research activities seem to be visible tackling this problem. The reasons might be the difficulties of finding an appropriate approach and an appropriate compariso ...

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January 1995 **ACM SIGCOMM Computer Communication Review**, Volume 25 Issue 1

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Richard H. Lathrop, Robert S. Kirk

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Full text available: pdf(936.09 KB) Additional Information: full citation, abstract, references, citings, index terms

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Xinping Zhu, Sharad Malik

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Full text available: pdf(124.52 KB) Additional Information: full citation, abstract, references, citings, index terms

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Bandula W. Abeysundara, Ahmed E. Kamal

June 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 2

Full text available: pdf(3.83 MB) Additional Information: full citation, abstract, references, citings, index terms, review

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Keywords: access schemes, computer networks, data communication, medium access protocols, optical fiber networks

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J. R. Agre, J. A. Clarke, M. W. Atkinson, I. H. Shahnawaz

December 1987 **Proceedings of the 19th conference on Winter simulation**

Full text available: pdf(1.32 MB) Additional Information: full citation, abstract, references, index terms

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John Rohlf, James Helman

July 1994 **Proceedings of the 21st annual conference on Computer graphics and interactive techniques**

Full text available: pdf(633.11 KB) ps(9.32 MB) Additional Information: full citation, abstract, references, citings, index terms

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7 Lower bounds for wait-free computation in message-passing systems

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John G. Torborg

August 1987 **ACM SIGGRAPH Computer Graphics, Proceedings of the 14th annual conference on Computer graphics and interactive techniques**, Volume 21 Issue 4

Full text available: pdf(1.18 MB) Additional Information: full citation, references, citings, index terms

9 Using channel state dependent packet scheduling to improve TCP throughput over wireless LANs

Pravin Bhagwat, Partha Bhattacharya, Arvind Krishma, Satish K. Tripathi
March 1997 **Wireless Networks**, Volume 3 Issue 1

Full text available: pdf(541.97 KB) Additional Information: full citation, abstract, references, citings, index terms

In recent years, a variety of mobile computers equipped with wireless communication devices have become popular. These computers use applications and protocols, originally developed for wired desktop hosts, to communicate over wireless channels. Unlike wired networks, packets transmitted on wireless channels are often subject to burst errors which cause back to back packet losses. In this paper we study the effect of burst packet errors and error recovery mechanisms employed in wireless MAC ...

10 MemorIES: a programmable, real-time hardware emulation tool for multiprocessor server design

Ashwini Nanda, Kwok-Ken Mak, Krishnan Sugavanam, Ramendra K. Sahoo, Vijayaraghavan Soundararajan, T. Basil Smith
November 2000 **ACM SIGPLAN Notices**, Volume 35 Issue 11

Full text available: pdf(1.84 MB) Additional Information: full citation, abstract, references, index terms

Modern system design often requires multiple levels of simulation for design validation and performance debugging. However, while machines have gotten faster, and simulators have become more detailed, simulation speeds have not tracked machine speeds. As a result, it is difficult to simulate realistic problem sizes and hardware configurations for a target machine. Instead, researchers have focussed on developing scaling methodologies and running smaller problem sizes and configurations that atte ...

11 IS '97: model curriculum and guidelines for undergraduate degree programs in information systems

Gordon B. Davis, John T. Gorgone, J. Daniel Couger, David L. Feinstein, Herbert E. Longenecker
December 1997 **ACM SIGMIS Database , Guidelines for undergraduate degree programs on Model curriculum and guidelines for undergraduate degree programs in information systems**, Volume 28 Issue 1

Full text available: pdf(7.24 MB) Additional Information: full citation, citings

12 Practical byzantine fault tolerance and proactive recovery

Miguel Castro, Barbara Liskov
November 2002 **ACM Transactions on Computer Systems (TOCS)**, Volume 20 Issue 4

Full text available: pdf(1.63 MB) Additional Information: full citation, abstract, references, index terms, review

Our growing reliance on online services accessible on the Internet demands highly available systems that provide correct service without interruptions. Software bugs, operator mistakes, and malicious attacks are a major cause of service interruptions and they can cause arbitrary behavior, that is, Byzantine faults. This article describes a new replication algorithm, BFT, that can be used to build highly available systems that tolerate Byzantine faults. BFT can be used in practice to implement re ...

Keywords: Byzantine fault tolerance, asynchronous systems, proactive recovery, state machine replication, state transfer

13 Balancing push and pull for data broadcast

Swarup Acharya, Michael Franklin, Stanley Zdonik

June 1997 **ACM SIGMOD Rec rd , Pr ceedings f the 1997 ACM SIGMOD international conference on Management of data**, Volume 26 Issue 2

Full text available: pdf(1.79 MB) Additional Information: full citation, abstract, references, citings, index terms

The increasing ability to interconnect computers through internet-working, wireless networks, high-bandwidth satellite, and cable networks has spawned a new class of information-centered applications based on data dissemination. These applications employ broadcast to deliver data to very large client populations. We have proposed the Broadcast Disks paradigm [Zdon94, Acha95b] for organizing the contents of a data broadcast program and for managing client resources in respon ...

14 A framework for the performance analysis of concurrent B-tree algorithms

Theodore Johnson, Dennis Shasha

April 1990 **Proceedings of the ninth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**

Full text available: pdf(1.46 MB) Additional Information: full citation, abstract, references, citings, index terms

Many concurrent B-tree algorithms have been proposed, but they have not yet been satisfactorily analyzed. When transaction processing systems require high levels of concurrency, a restrictive serialization technique on the B-tree index can cause a bottleneck. In this paper, we present a framework for constructing analytical performance models of concurrent B-tree algorithms. The models can predict the response time and maximum throughput. We analyze three algorithms: Naive Lock-coupling, Op ...

15 U-Net: a user-level network interface for parallel and distributed computing (includes URL)

T. von Eicken, A. Basu, V. Buch, W. Vogels

December 1995 **ACM SIGOPS Operating Systems Review , Proceedings of the fifteenth ACM symposium on Operating systems principles**, Volume 29 Issue 5

Full text available: pdf(1.84 MB) Additional Information: full citation, references, citings, index terms

16 Impact of hardware interconnection structures on the performance of decentralized software

Robert J. Souza, Edward E. Balkovich

May 1981 **Proceedings of the 8th annual symposium on Computer Architecture**

Full text available: pdf(505.73 KB) Additional Information: full citation, abstract, references, index terms

The results of an investigation of the relationship between software structure, hardware interconnect structure, and the performance of decentralized computer systems are presented in this paper. Programs written in a language that has the salient features of most languages suggested for decentralized software were analyzed using trace-driven simulation. Results indicate that reasonable performance may be obtained at relatively low bandwidths using typical decentralized interconnect structu ...

17 RASSP virtual prototyping of DSP systems

C. Hein, J. Pridgen, W. Kline

June 1997 **Pr ceedings of the 34th annual conference on Design aut mation conference**

Full text available: pdf(128.85 KB) Additional Information: full citation, references, index terms

18 NETWORK II.5 tutorial (tutorial session): network modeling without programming
William J. Garrison
December 1990 **Proceedings of the 22nd conference on Winter simulation**
Full text available: pdf(315.24 KB) Additional Information: full citation, references, index terms

19 A fiber optic hypermesh for SIMD/MIMD machines
Ted Szymanski
November 1990 **Proceedings of the 1990 ACM/IEEE conference on Supercomputing**
Full text available: pdf(1.41 MB) Additional Information: full citation, abstract, references

A fiber optic multidimensional mesh-based network for SIMD and MIMD multiprocessors is proposed. For the basic building block, a novel distributed optical switch is proposed; The switch requires 50 % fewer lasers/receivers than previous WDM optical crossbars and uses a novel random-access scheme which supports prioritized traffic. To implement very large networks using lasers with limited tunability (or electronic crossbars of small degree) we propose arranging switches into a novel *n*-dim ...

20 Simulation modelling support via network based concepts
Stephen C. Mathewson
December 1990 **Proceedings of the 22nd conference on Winter simulation**
Full text available: pdf(953.01 KB) Additional Information: full citation, references, citings, index terms

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1 Modeling methodology for integrated simulation of embedded systems

Akos Ledeczi, James Davis, Sandeep Neema, Aditya Agrawal

January 2003 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 13 Issue 1

Full text available: pdf(951.86 KB) Additional Information: full citation, abstract, references, index terms

Developing a single embedded application involves a multitude of different development tools including several different simulators. Most tools use different abstractions, have their own formalisms to represent the system under development, utilize different input and output data formats, and have their own semantics. A unified environment that allows capturing the system in one place and one that drives all necessary simulators and analysis tools from this shared representation needs a common r ...

Keywords: Simulation, domain specific languages, metamodeling, model integrated computing, modeling, simulation integration

2 A hierarchical modeling framework for on-chip communication architectures

Xinping Zhu, Sharad Malik

November 2002 **Proceedings of the 2002 IEEE/ACM international conference on Computer-aided design**

Full text available: pdf(124.52 KB) Additional Information: full citation, abstract, references, citings, index terms

The communication sub-system of complex IC systems is increasingly critical for achieving system performance. Given this, it is important that the on-chip communication architecture should be included in any quantitative evaluation of system design during design space exploration. While there are several mature methodologies for the modeling and evaluation of architectures of processing elements, there is relatively little work done in modeling of an extensive range of on-chip communication arch ...

3 Introduction to simulation

Robert E. Shannon

December 1992 **Proceedings f the 24th conference on Winter simulati n**

Full text available: pdf(947.25 KB) Additional Information: full citation, references, citings, index terms

4 Simulation and verification: A new performance evaluation approach for system level design space exploration
C. P. Joshi, Anshul Kumar, M. Balakrishnan
October 2002 **Proceedings of the 15th international symp sium n System Synthesis**
Full text available: pdf(168.41 KB) Additional Information: full citation, abstract, references, index terms

Application specific systems have potential for customization of design with a view to achieve a better cost-performance-power trade-off. Such customization requires extensive design space exploration. In this paper, we introduce a performance evaluation methodology for system-level design exploration that is much faster than traditional cycle-accurate simulation. The trade off is between accuracy and simulation speed. The methodology is based on probabilistic modeling of system components custo ...

Keywords: design space exploration, statistical simulation, system level design

5 Improving the aircraft design process using Web-based modeling and simulation
John A. Reed, Gregory J. Follen, Abdollah A. Afjeh
January 2000 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 10 Issue 1
Full text available: pdf(1.06 MB) Additional Information: full citation, abstract, references, index terms

Designing and developing new aircraft systems is time-consuming and expensive. Computational simulation is a promising means for reducing design cycle times, but requires a flexible software environment capable of integrating advanced multidisciplinary and multifidelity analysis methods, dynamically managing data across heterogeneous computing platforms, and distributing computationally complex tasks. Web-based simulation, with its emphasis on collaborative composition of simulation models, ...

Keywords: Java, Web-based simulation, aircraft design, object-oriented

6 Concepts for production modeling systems based on multiple user types
Charles R. Standridge, Martha A. Centeno
December 1991 **Proceedings of the 23rd conference on Winter simulation**
Full text available: pdf(693.13 KB) Additional Information: full citation, references, citings, index terms

7 Cycle and phase accurate DSP modeling and integration for HW/SW co-verification
Lisa Guerra, Joachim Fitzner, Dipankar Talukdar, Chris Schläger, Bassam Tabbara, Vojin Zivojnovic
June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation conference**
Full text available: pdf(455.90 KB) Additional Information: full citation, references, citings, index terms

8 A new concept for accurate modeling of VLSI interconnections and its application for timing simulation
B. Wunder, G. Lehmann, K. Müller-Glaser
September 1996 **Proceedings of the conference on Eur pean design aut mati n**
Full text available: pdf(415.21 KB) Additional Information: full citation, references, index terms

9 Rapid design space exploration of heterogeneous embedded systems using symbolic search and multi-granular simulation
S. Mohanty, V. K. Prasanna, S. Neema, J. Davis
June 2002 **ACM SIGPLAN N tices , Pr ceedings of the j int c nference n Languages, compilers and t ls f r embedded systems: software and c mpilers f r embedded systems**, Volume 37 Issue 7
Full text available: pdf(356.42 KB) Additional Information: full citation, abstract, references, citings, index terms

In addition to integrating different Intellectual Property cores, heterogeneous embedded systems provide several architecture knobs such as voltage, operating frequency, configuration, etc. that can be varied to optimize performance. Such flexibilities results in a large design space making system optimization a very challenging task. Moreover, such systems operate in mobile and other power constrained environments. Therefore, in addition to rapid exploration of a large design space a designer h ...

Keywords: binary decision diagram, design space, model integrated computing, modeling, multi-granular simulation, performance estimation, symbolic search

10 An integrated environment for modeling large scale electronics manufacturing
Michael G. Ketcham
December 1992 **Proceedings of the 24th conference on Winter simulation**
Full text available: pdf(637.14 KB) Additional Information: full citation, references, index terms

11 Simulation modeling and methodology
Robert E. Shannon
December 1976 **Proceedings of the 76 Bicentennial conference on Winter simulation**
Full text available: pdf(602.19 KB) Additional Information: full citation, abstract, references, index terms

Simulation is one of the most powerful analysis tools available to those responsible for the design and/or operation of complex processes or systems. It is heavily based upon computer science, mathematics, probability theory and statistics: yet the process of simulation modeling and experimentation remains very much an intuitive art. Simulation is a very general and somewhat ill-defined subject. For the purpose of this paper, we will define simulation as, "the process of designing a c ...

12 SimJAVA—a framework for modeling queueing networks in Java
Wolfgang Kreutzer, Jane Hopkins, Marcel van Mierlo
December 1997 **Proceedings of the 29th conference on Winter simulation**
Full text available: pdf(674.89 KB) Additional Information: full citation, references, index terms

13 Capacity and performance analysis of computer systems
James N. Robinson
December 1994 **Proceedings of the 26th conference on Winter simulation**
Full t xt availabl : pdf(869.99 KB) Additional Information: full citation, references, citings, index terms

14 Microprocessor systems modeling with MODLAN
A. Pawlak
June 1983 **Pr ceedings f the twentieth design aut mation conference on Design**

aut mati n

Full text available: pdf(39.75 KB) Additional Information: full citation, abstract, index terms

The paper presents a digital logic modeling system based on MODLAN language. MODLAN, the Hardware Description Language (HDL), is especially useful for hierarchical modeling of microprocessor systems. The modeling system supports both natural design philosophies, i.e., top-down and bottom-up. At each design stage a user is provided with MODLAN language constructs, enabling notation of his design concept and its verification through simulation. A brief presentation of the MODLAN la ...

15 An integrated design environment for performance and dependability analysis

Robert H. Klenke, Moshe Meyassed, James H. Aylor, Barry W. Johnson, Ramesh Rao, Anup Ghosh

June 1997 **Proceedings of the 34th annual conference on Design automation conference**

Full text available: pdf(119.65 KB) Additional Information: full citation, references, citings, index terms

16 Special Session on Design Paradigms: Interoperability as a design issue in C++ based modeling environments

Frederic Doucet, Rajesh Gupta, Masato Otsuka, Patrick Schaumont, Sandeep Shukla

September 2001 **Proceedings of the 14th international symposium on Systems synthesis**

Full text available: pdf(102.94 KB) Additional Information: full citation, abstract, references

The increasing heterogeneity and complexity of VLSI systems has made the use of C++ popular for building simulation and synthesis models at higher levels of abstraction. Currently, there are several different embodiments of C++ based environments, mostly in the form of hardware modeling libraries built on top of C++. However, the *semantic gap*between hardware modeling concepts, and the software programming language constructs, poses several isues which require critical examination. In this ...

17 Advances in system modeling: Transaction level modeling: an overview

Lukai Cai, Daniel Gajski

October 2003 **Proceedings of the 1st IEEE/ACM/IFIP international conference on Hardware/software codesign & system synthesis**

Full text available: pdf(150.94 KB) Additional Information: full citation, abstract, references, index terms

Recently, the transaction-level modeling has been widely referred to in system-level design community. However, the transaction-level models(TLMs) are not well defined and the usage of TLMs in the existing design domains, namely modeling, validation, refinement, exploration, and synthesis, is not well coordinated. This paper introduces a TLM taxonomy and compares the benefits of TLMs' use.

Keywords: exploration, modeling, refinement, synthesis, transaction level model, validation

18 System design using an integrated specification and performance modeling methodology

A. Sarkar

September 1996 **Pr ceedings f the c nference n Eur pean design aut mation**

Full text available: pdf(47.81 KB) Additional Information: full citation, references, index terms

19 A case study on modeling shared memory access effects during performance analysis of HW/SW systems

Marcello Lajolo, Anand Raghunathan, Sujit Dey, Luciano Lavagno, Alberto Sangiovanni-Vincentelli

March 1998 **Proceedings of the 6th international workshop on Hardware/software co-design**

Full text available: pdf(66.12 KB) Additional Information: full citation, references, citings, index terms
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20 Modeling with Extend

David Krahl

November 1996 **Proceedings of the 28th conference on Winter simulation**

Full text available: pdf(485.84 KB) Additional Information: full citation, references, citings

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1 The integration of application and system based metrics in a parallel program performance tool

Jeffrey K. Hollingsworth, R. Bruce Irvin, Barton P. Miller

April 1991 **ACM SIGPLAN Notices , Proceedings of the third ACM SIGPLAN symposium on Principles and practice of parallel programming,** Volume 26 Issue 7

Full text available: pdf(1.21 MB) Additional Information: full citation, references, citings, index terms

2 A microarchitectural performance evaluation of a 3.2 Gbyte/s microprocessor bus

Tim Stanley, Michael Upton, Patrick Sherhart, Trevor Mudge, Richard Brown

December 1993 **Proceedings of the 26th annual international symposium on Microarchitecture**

Full text available: pdf(1.13 MB) Additional Information: full citation, references, citings

Keywords: I/O microarchitecture, bandwidth, hardware description language, latency, performance modeling

3 Space-time characteristics of ALOHA protocols in high-speed bidirectional bus networks

Whay Chiou Lee, Pierre A. Humblet

October 1995 **IEEE/ACM Transactions on Networking (TON)**, Volume 3 Issue 5

Full text available: pdf(914.40 KB) Additional Information: full citation, references, index terms

4 Simulator for the evaluation of distributed network-system performance

Toshio Komatsu, Yukihiro Nakamura, Junro Nose

November 1996 **Proceedings of the 28th c nference on Winter simulation**

Full text available: pdf(692.00 KB) Additional Information: full citation, references

5 Simulation analysis of a collisionless multiple access protocol for a wavelength division multiplexed star-coupled configuration
Patrick W. Dowd, Kalyani Bogineni
April 1992 **Proceedings of the 25th annual symposium on Simulation**
Full text available: pdf(1.04 MB) Additional Information: full citation, references, index terms

6 Verification techniques for cache coherence protocols
Fong Pong, Michel Dubois
March 1997 **ACM Computing Surveys (CSUR)**, Volume 29 Issue 1
Full text available: pdf(1.25 MB) Additional Information: full citation, abstract, references, citings, index terms

In this article we present a comprehensive survey of various approaches for the verification of cache coherence protocols based on state enumeration, (symbolic model checking, and symbolic state models. Since these techniques search the state space of the protocol exhaustively, the amount of memory required to manipulate that state information and the verification time grow very fast with the number of processors and the complexity of the protocol mechanism ...

Keywords: cache coherence, finite state machine, protocol verification, shared-memory multiprocessors, state representation and expansion

7 Computing curricula 2001
September 2001 **Journal on Educational Resources in Computing (JERIC)**
Full text available: pdf(613.63 KB) html(2.78 KB) Additional Information: full citation, references, citings, index terms

8 Computer simulation of communications on the space station data management system
J. R. Agre, J. A. Clarke, M. W. Atkinson, I. H. Shahnawaz
December 1987 **Proceedings of the 19th conference on Winter simulation**
Full text available: pdf(1.32 MB) Additional Information: full citation, abstract, references, index terms

A discrete event simulation model for performance evaluation of various alternatives in the design of the communication system on the Data Management System (DMS) of the space station has been developed. DMS.SIM, the SIMSCRIPT-based model of DMS consists of two components: (I) The communication architecture model of multiple, interconnected, fiber-optic, local area networks (LANs) where the LAN access protocol is either token-bus or a version of CSMA/CD with deterministic collision ...

9 Packet-switched local area networks using wavelength-selective station couplers
Adrian Grah, Terence D. Todd
April 2000 **IEEE/ACM Transacti ns on Networking (TON)**, Volume 8 Issue 2

Full text available: pdf(338.06 KB) Additional Information: full citation, references, index terms

10 High-speed local area networks and their performance: a survey

Bandula W. Abeysundara, Ahmed E. Kamal
June 1991 **ACM Computing Surveys (CSUR)**, Volume 23 Issue 2

Full text available: pdf(3.83 MB) Additional Information: full citation, abstract, references, citings, index terms, review

At high data transmission rates, the packet transmission time of a local area network (LAN) could become comparable to or less than the medium propagation delay. The performance of many LAN schemes degrades rapidly when the packet transmission time becomes small comparative to the medium propagation delay. This paper introduces LANs and discusses the performance degradation of LANs at high speeds. It surveys recently proposed LAN schemes designed to operate at high data rates, including the ...

Keywords: access schemes, computer networks, data communication, medium access protocols, optical fiber networks

11 Query evaluation techniques for large databases

Goetz Graefe
June 1993 **ACM Computing Surveys (CSUR)**, Volume 25 Issue 2

Full text available: pdf(9.37 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Database management systems will continue to manage large data volumes. Thus, efficient algorithms for accessing and manipulating large sets and sequences will be required to provide acceptable performance. The advent of object-oriented and extensible database systems will not solve this problem. On the contrary, modern data models exacerbate the problem: In order to manipulate large sets of complex objects as efficiently as today's database systems manipulate simple records, query-processi ...

Keywords: complex query evaluation plans, dynamic query evaluation plans, extensible database systems, iterators, object-oriented database systems, operator model of parallelization, parallel algorithms, relational database systems, set-matching algorithms, sort-hash duality

12 The VMP multiprocessor: initial experience, refinements, and performance evaluation

D. R. Cheriton, A. Gupta, P. D. Boyle, H. A. Goosen
May 1988 **ACM SIGARCH Computer Architecture News , Proceedings of the 15th Annual International Symposium on Computer architecture**, Volume 16 Issue 2

Full text available: pdf(1.73 MB) Additional Information: full citation, abstract, references, citings, index terms

VMP is an experimental multiprocessor being developed at Stanford University, suitable for high-performance workstations and server machines. Its primary novelty lies in the use of software management of the per-processor caches and the design decisions in the cache and bus that make this approach feasible. The design and some uniprocessor trace-driven simulations indicating its performance have been reported previously. In this paper, we present our initial experience with the V ...

13 The Information Bus: an architecture for extensible distributed systems

Brian Oki, Manfred Pfluegl, Alex Siegel, Dale Skeen

December 1993 **ACM SIGOPS Operating Systems Review , Proceedings of the fourteenth ACM symp sium n Operating systems principles**, Volume 27 Issue 5

Full text available: pdf(1.12 MB) Additional Information: full citation, abstract, references, citings, index terms

Research can rarely be performed on large-scale, distributed systems at the level of thousands of workstations. In this paper, we describe the motivating constraints, design principles, and architecture for an extensible, distributed system operating in such an environment. The constraints include continuous operation, dynamic system evolution, and integration with extant systems. The *Information Bus*, our solution, is a novel synthesis of four design principles: core communication protoco ...

14 An optimized contention protocol for broadband networks

W. Worth Kirkman

August 1987 **ACM Transactions on Computer Systems (TOCS)**, Volume 5 Issue 3

Full text available: pdf(578.28 KB) Additional Information: full citation, abstract, references, index terms, review

This paper describes the concepts underlying an alternative link-level protocol for broadband local networks. The protocol uses implicit slotting of the contention channel to support larger networks, improve performance, and provide reliable distributed collision recognition without reinforcement. It is designed such that compatible interfaces to existing CSMA/CD-based systems can be provided.

15 Distributed round-robin and first-come first-serve protocols and their applications to multiprocessor bus arbitration

M. K. Vernon, U. Manber

May 1988 **ACM SIGARCH Computer Architecture News , Proceedings of the 15th Annual International Symposium on Computer architecture**, Volume 16 Issue 2

Full text available: pdf(1.25 MB) Additional Information: full citation, abstract, references, citings, index terms

Two new distributed protocols for fair and efficient bus arbitration are presented. The protocols implement round-robin (RR) and first-come first-serve (FCFS) scheduling, respectively. Both protocols use relatively few control lines on the bus, and their logic is simple. The round-robin protocol, which uses statically assigned arbitration numbers to resolve conflict during an arbitration, is more robust and simpler to implement than previous distributed RR protocols that ar ...

16 Performance evaluation of Ethernet and HYPERbus local area networks using computer modeling

David S. Jennings, Aaron H. Konstam

December 1985 **Proceedings of the 17th conference on Winter simulation**

Full text available: pdf(630.16 KB) Additional Information: full citation, abstract, references

The local area networks Ethernet and HYPERbus were simulated using the GPSS program language. Measurements of performance were network stability, messages transmitted per unit time, and the number of transmission attempts required per message. The simulations produced these results. Both networks were stable at the normal, 90 and 100 percent loads. At the 90 and 100 percent loads, Ethernet transmitted between 90.31 and 99.16 percent of the expected

number of messages per unit time. HYPERbus ...

17 Multiprocessing design verification methodology for Motorola MPC74XX PowerPC microprocessor

Jen-Tien Yen, Qichao Richard Yin

June 2000 **Proceedings of the 37th conference on Design aut mation**

Full text available: pdf(73.14 KB) Additional Information: full citation, abstract, references, citings, index terms

Multiprocessing (MP) design verification has been one of the bottlenecks for high performance microprocessor design projects. The problem is getting worse as the design complexity increases and more cache structures are integrated into one single chip. The challenges that MP verification faces today include: huge chip/system simulation model sizes, long simulation cycles, relative inefficiency of the simulation tools compared to uniprocessor, and so on. To solve these challenging problems, ...

18 Algorithms for scalable synchronization on shared-memory multiprocessors

John M. Mellor-Crummey, Michael L. Scott

February 1991 **ACM Transactions on Computer Systems (TOCS)**, Volume 9 Issue 1

Full text available: pdf(3.07 MB) Additional Information: full citation, abstract, references, citings, index terms, review

Busy-wait techniques are heavily used for mutual exclusion and barrier synchronization in shared-memory parallel programs. Unfortunately, typical implementations of busy-waiting tend to produce large amounts of memory and interconnect contention, introducing performance bottlenecks that become markedly more pronounced as applications scale. We argue that this problem is not fundamental, and that one can in fact construct busy-wait synchronization algorithms that induce no memory or interc ...

19 Concurrent fault detection for a multiple-plane packet switch

Roberto Rojas-Cessa, Eiji Oki, H. Jonathan Chao

August 2003 **IEEE/ACM Transactions on Networking (TON)**, Volume 11 Issue 4

Full text available: pdf(711.66 KB) Additional Information: full citation, abstract, references, index terms

In high-speed and high-capacity packet switches, system reliability is critical to avoid loss of huge amounts of information and retransmission of traffic. We propose a series of concurrent fault-detection mechanisms for a multiple-plane crossbar-based packet switch. Our switch model, called the *m+z* model, has *m* active planes and *z* spare planes. This switch has distributed arbiters on each plane. The spare planes, used for substitution of faulty active ones, are also ...

Keywords: concurrent testing, fault detection, packet switch, parallel planes, single fault

20 A computer communication technique using content-induced transaction overlap

Simon Y. Berkovich, Colleen Roe Wilson

February 1984 **ACM Transacti ns on C mputer Systems (TOCS)**, Volume 2 Issue 1

Full text available: pdf(988.70 KB) Additional Information: full citation, references, citings, index terms

Keyw rds: associative proceeding, communication protocol, data compression, multiaccess channels

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1 Simulating modular microcomputers
Frank J. Langley, Gerald A. LaGro, Joan Sheehan
March 1978 **Proceedings of the eleventh annual simulation symposium**

Full text available: pdf(1.47 MB) Additional Information: full citation, abstract, references, citings, index terms

The commitment of microprocessor-based system configurations to detailed logic design and breadboard fabrication traditionally results in a costly development cycle. This paper reports on the use of a computer design high-order-language (HOL) to simulate micro-computer functional elements, "macromodules", at the register level, and verify the timing and interface requirements for a family of microcomputer configurations. The definitions of these microcomputer macromodules (i. e. ...

2 A network interface unit simulation using micro passim
Tom P. Vayda, Larry L. Wear
December 1983 **Proceedings of the 15th conference on Winter simulation - Volume 1**

Full text available: pdf(734.88 KB) Additional Information: full citation, abstract, references, index terms

This paper describes how micro PASSIM, a GPSS based simulation system, was transported from the Apple II to the HP 9836. The problems associated with moving a large program form one UCSD Pascal system to another are discussed. Micro PASSIM was transported to the HP system so that an Ethernet to HPIB interface board could be modeled. The model is described and the results obtained from the simulation are discussed. A discussion of the advantages and disadvantages of using micro PASSIM rather ...

3 Computerized measurement of operator performance on simulators
Edward J. Kozinsky
January 1981 **Proceedings of the 13th conference on Winter simulation - Volume 1**

Full text available: pdf(360.50 KB) Additional Information: full citation, abstract, references, index terms

This computer-based system aids in evaluating operator's performance on a power plant simulator. The Performance Measurement System (PMS) helps the instructor in his total evaluation by providing objective measurements and documentation of operator reaction time, sequence of manipulation, and extent of parametric control. These measurements can also apply to Human Factors research on the operator-control room interface.

4 Real time simulation of elevators

George T. Hummet, Thomas D. Moser, Bruce A. Powell
December 1978 **Pr ceedings f the 10th conference on Winter simulati n - V lume 2**

Full text available: pdf(1.72 MB) Additional Information: full citation, abstract, references, citings, index terms

The principal transportation system in a highrise building is the elevator system. The performance of the system as perceived by the passengers can be measured by the time spent waiting for a car and smoothness of the ride. In turn, the waiting time is a very complex function of many variables: number of cars, car speed, number of floors served, passenger traffic, elevator dispatching strategy, etc. This paper discusses a recently developed minicomputer simulator, ELSIM, which simulates pas ...

5 A distributed approach to queueing network simulation
J. Kent Peacock, J. W. Wong, Eric Manning
December 1979 **Proceedings of the 11th conference on Winter simulation - Volume 2**

Full text available: pdf(641.23 KB) Additional Information: full citation, abstract, references, citings, index terms

Discrete simulation is a widely used technique for system performance evaluation. The conventional approach to discrete simulation (e.g., GPSS, Simscript) does not attempt to exploit the parallelism typically available in queueing network models. In this paper, a distributed approach to discrete simulation is presented. It involves the decomposition of a simulation into components and the synchronization of these components by message passing. This approach can result in the speedup of the ...

6 Evaluating the performance of a unified switching node using a simulated network
Kenneth J. Bodzioch, Bernard E. Patrusky
December 1976 **Proceedings of the 76 Bicentennial conference on Winter simulation**

Full text available: pdf(750.45 KB) Additional Information: full citation, abstract, references, index terms

This paper describes a program which utilizes a discrete event simulation to drive a real switching node. Empirical measurements of various nodal performance characteristics are gathered and recorded during the exercise of this program to aid in the evaluation and design of candidate future nodal architectures. Applications software and specialized hardware for a unified node which switches both digitized voice and data (packet) traffic were developed and tested in a flexible tes ...

7 Design and implementation of a flexible and interactive microprogram simulator
M. Mezzalama, P. Prinetto
November 1979 **Proceedings of the 12th annual workshop on Microprogramming**

Full text available: pdf(513.00 KB) Additional Information: full citation, abstract, references, citings, index terms

In the present paper a microprogrammable architecture oriented simulator is described. This simulator structure may be logically subdivided in four independent blocks: Supervisor, Interface Module, Simulation Monitor, Simulation Routines. A high degree of flexibility is obtained by means of a highly hierarchical structure of software and an easy-to-modify table-driven system description. Moreover particular care has been devoted to user-simulator communication via an easy-to-use ...

8 A methodology for simulating computer systems
Peter L. Haigh
March 1982 **Proceedings of the fifteenth annual simulati n symposium**

Full text available: pdf(1.86 MB) Additional Information: full citation, abstract, references, index terms

Simulation languages, while providing the modeler with the essential tools for model

development, do not provide well defined philosophies for modeling specific classes of systems. Although some languages strongly suggest a particular modeling approach, deriving from a particular world view, a methodology must be developed by the practitioner. A methodology for developing simulation models of computer systems is discussed. In all computer systems there are universal processes which may be b ...

9 Simulation and verification: Efficient simulation of synthesis-oriented system level designs

Nick Savoiu, Sandeep K. Shukla, Rajesh K. Gupta
October 2002 **Proceedings of the 15th international symposium on System Synthesis**

Full text available: pdf(314.66 KB) Additional Information: full citation, abstract, references, index terms

Modeling for synthesis and modeling for simulation seem to be two competing goals in the context of C++-based modeling frameworks. One of the reasons is while most hardware systems have some inherent parallelism efficiently expressing it depends on whether the target usage is synthesis or simulation. For synthesis, designs are usually described with synthesis tools in mind and are therefore partitioned according to the targeted hardware units. For simulation, runtime efficiency is critical but o ...

Keywords: SystemC, simulation, system-level design

10 Simulation education: A crowd of little man computers: visual computer simulator teaching tools

William Yurcik, Hugh Osborne
December 2001 **Proceedings of the 33nd conference on Winter simulation**

Full text available: pdf(437.82 KB) Additional Information: full citation, abstract, references, citings

This paper describes the use of a particular type of computer simulator as a tool for teaching computer architecture. The Little Man Computer (LMC) paradigm was developed by Stuart Madnick of MIT in the 1960s and has stood the test of time as a conceptual device that helps students understand the basics of how a computer works. With the success of the LMC paradigm, LMC simulators have also proliferated. We compare and contrast the current crowd of LMC simulators highlighting visual features. We ...

11 SWiMNet: a scalable parallel simulation testbed for wireless and mobile networks

Azzedine Boukerche, Sajal K. Das, Alessandro Fabbri
September 2001 **Wireless Networks**, Volume 7 Issue 5

Full text available: pdf(397.98 KB) Additional Information: full citation, abstract, references, index terms

We present a framework, called SWiMNet, for parallel simulation of wireless and mobile PCS networks, which allows realistic and detailed modeling of mobility, call traffic, and PCS network deployment. SWiMNet is based upon event precomputation and a combination of optimistic and conservative synchronization mechanisms. Event precomputation is the result of model independence within the global PCS network. Low percentage of blocked calls typical for PCS networks is exploited in the channel alloca ...

Keywords: PCS network models, framework for PCS network simulation, parallel discrete event simulation, performance analysis

12 Toward real time simulation: prototyping of a large scale parallel ground target simulation

John B. Gilmer, David W. O'Brien, Jeffery E. Payne
December 1990 **Proceedings f the 22nd c nference on Winter simulati n**

Full text available: pdf(878.73 KB) Additional Information: full citation, references, citings, index terms

13 HAL II: a mixed level hardware logic simulation system
Shigeru Takasaki, Tohru Sasaki, Nobuyoshi Nomizu, Hiroshi Ishikura, Nobuhiko Koike
July 1986 **Proceedings of the 23rd ACM/IEEE conference on Design automation**

Full text available: pdf(678.52 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper describes a mixed level hardware logic simulation system, called Hardware Logic Simulator II (HAL II). This paper first shows a HAL II simulation method. Then, it overviews HAL II hardware and software system configurations, simulation mechanism and estimates system performance. The HAL II system can handle a maximum of 5.8 million gates and a high level design language FDL (Functional Description Language). Finally, it discusses system applications and results. The paper also in ...

14 Exploiting model independence for parallel PCS network simulation
Azzedine Boukerche, Sajal K. Das, Alessandro Fabbri, Oktay Yildiz
May 1999 **Proceedings of the thirteenth workshop on Parallel and distributed simulation**

Full text available: pdf(688.35 KB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

In this paper, we present a parallel simulator (SWiMNet) for PCS networks using a combination of optimistic and conservative paradigms. The proposed methodology exploits event precomputation permitted by model independence within the PCS components. The low percentage of blocked calls is exploited in the channel allocation simulation of precomputed events by means of an optimistic approach. %To illustrate and verify the developed approach, Experiments were conducted with various call arrival rat ...

15 An architecture level simulation methodology
Paul D. Stigall, Ram Huggahalli
April 1991 **Proceedings of the 24th annual symposium on Simulation**

Full text available: pdf(1.24 MB) Additional Information: full citation, references, index terms

16 Dynamic memory usage in parallel simulation: a case study of a large-scale military logistics application
Chris J. M. Booth, David I. Bruce, Peter R. Hoare, Michael J. Kirton, K. Roy Milner, Ian J. Relf
November 1996 **Proceedings of the 28th conference on Winter simulation**

Full text available: pdf(743.98 KB) Additional Information: full citation, references

17 Using the SimOS machine simulator to study complex computer systems
Mendel Rosenblum, Edouard Bugnion, Scott Devine, Stephen A. Herrod
January 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 1

Full text available: pdf(731.76 KB) Additional Information: full citation, references, citings, index terms, review

Keywords: computer architecture, computer simulation, computer system performance analysis, operating systems

18 A comparison of methods for simulating computer bus architectures

Larry Wear

January 1981 **Proceedings of the 13th conference on Winter simulation - Volume 1**

Full text available: pdf(389.90 KB) Additional Information: full citation, abstract, references, index terms

This paper describes three methods that were used to investigate multiprocessor bus architectures. The models described were implemented in FORTRAN, GPSS, and SIMULA. Characteristics of the three implementations, such as program length, program memory requirements, execution time and ease of use are compared. Results of the simulation of a single bus system are presented to show how the various parameters affect system performance.

19 Modeling and simulation in product development

Douglas G. Boike, Edward H. Ernst

March 1982 **Proceedings of the fifteenth annual simulation symposium**

Full text available: pdf(401.24 KB) Additional Information: full citation, abstract, index terms

As part of the product development cycle, the Xerox Corporation has evolved a modeling and simulation methodology. This paper describes the approach, its use, and value in product development. To provide a common basis for understanding the modeling activities to be discussed, a brief overview of the xerographic process as used in our current duplicator copier products is described. Each of the functions is discussed in terms of how they contribute to the overall systems model and how they ...

20 Simulation experiments of a tree organized multicomputer

J. Archer Harris, David R. Smith

April 1979 **Proceedings of the 6th annual symposium on Computer architecture**

Full text available: pdf(533.62 KB) Additional Information: full citation, abstract, references, citings, index terms

The paper describes the results of simulation experiments of a tree organized multicomputer now being constructed in the Department of Computer Science at Stony Brook. First the structure of the multicomputer is introduced. This is based on, (i) separate local memories, (ii) a tree organization mirrored on that of social structures, and (iii) a distributed file system. The simulation studies were designed to illuminate the performance of the multicomputer when cooperat ...

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Terms used **cross bar bus** and **dma** and **simulat** Found **5,197** of **125,779**

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1 Performance evaluation: Modeling and optimization of non-blocking checkpointing for optimistic simulation on myrinet clusters
Francesco Quaglia, Andrea Santoro
June 2003 **Proceedings of the 17th annual international conference on Supercomputing**
Full text available: pdf(253.35 KB) Additional Information: full citation, abstract, references, index terms

Checkpointing and Communication Library (CCL) is a recently developed software implementing CPU offloaded checkpointing functionalities in support of optimistic parallel simulation on myrinet clusters. Specifically, CCL implements a *non-blocking* execution mode of memory-to-memory data copy associated with checkpoint operations, based on data transfer capabilities provided by a programmable DMA engine on board of myrinet network cards. Re-synchronization between CPU and DMA activities must ...

Keywords: DMA, checkpointing, optimistic simulation, performance optimization

2 Semi-asynchronous checkpointing for optimistic simulation on a Myrinet based NOW
Francesco Quaglia, Andrea Santoro
May 2001 **Proceedings of the fifteenth workshop on Parallel and distributed simulation**
Full text available: pdf(687.31 KB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

Great effort has been devoted to the design of optimized checkpointing strategies for optimistic parallel discrete event simulators. On the other hand there is less work in the direction to improve the execution mode of any single checkpoint operation. Specifically, checkpoint operations are typically charged to the CPU, thus leading to freezing of the simulation application while checkpointing is in progress, i.e. the execution mode of the checkpointing protocol is typically synchronous. ...

3 Optimistic simulation II: Conditional checkpoint abort: an alternative semantic for re-synchronization in CCL
Francesco Quaglia, Andrea Santoro, Bruno Ciciani
May 2002 **Pr ceedings f the sixteenth w rkshop on Parallel and distributed simulation**
Full text available: pdf(988.56 KB) Additional Information: full citation, abstract, references

Publisher Site

Recently, a Checkpointing and Communication Library (CCL) to support optimistic parallel simulation on myrinet based clusters has been presented. Beyond classical low latency message delivery functionalities, this library additionally offers CPU offloaded checkpointing functionalities based on data transfer capabilities provided by a programmable DMA engine on board of myrinet network cards. A re-synchronization functionality is also supported for both logical (i.e. data consistency) and practic ...

Keywords: Optimistic Simulation, Rollback Based Synchronization, Checkpointing,Performance Optimization

4 Telecommunications: Communications and network: benefits from semi-asynchronous checkpointing for time warp simulations of a large state PCS model

Andrea Santoro, Francesco Quaglia

December 2001 **Proceedings of the 33nd conference on Winter simulation**

Full text available: pdf(121.12 KB) Additional Information: full citation, abstract, references, citings

Checkpointing overhead is a major obstacle for the effectiveness of Time Warp parallel discrete event simulators. Semi-asynchronous checkpointing is a recent solution to tackle this obstacle for Time Warp simulations on distributed memory systems based on Myrinet. In this solution, checkpoint operations are offloaded from the host CPU and are charged to a DMA engine on board of Myrinet network cards. In this paper we report an empirical evaluation of the benefits from semi-asynchronous checkpoin ...

5 Simulation and verification: Efficient simulation of synthesis-oriented system level designs

Nick Savoiu, Sandeep K. Shukla, Rajesh K. Gupta

October 2002 **Proceedings of the 15th international symposium on System Synthesis**

Full text available: pdf(314.66 KB) Additional Information: full citation, abstract, references, index terms

Modeling for synthesis and modeling for simulation seem to be two competing goals in the context of C++-based modeling frameworks. One of the reasons is while most hardware systems have some inherent parallelism efficiently expressing it depends on whether the target usage is synthesis or simulation. For synthesis, designs are usually described with synthesis tools in mind and are therefore partitioned according to the targeted hardware units. For simulation, runtime efficiency is critical but o ...

Keywords: SystemC, simulation, system-level design

6 Performance measurement and trace driven simulation of parallel CAD and numeric applications on a hypercube multicomputer

Jiun-Ming Hsu, Prithviraj Banerjee

May 1990 **ACM SIGARCH Computer Architecture News , Proceedings of the 17th annual international symposium on Computer Architecture**, Volume 18 Issue 3

Full text available: pdf(1.21 MB) Additional Information: full citation, abstract, references, citings, index terms

This paper presents the performance evaluation, workload characterization and trace driven simulation of a hypercube multi-computer running realistic workloads. Six representative parallel applications were selected as benchmarks. Software monitoring techniques were then used to collect execution traces. Based on the measurement results, we investigated both the computation and communication behavior of these parallel programs, including CPU utilization, computation task granularity, messag ...

7 A network interface unit simulation using micro passim

Tom P. Vayda, Larry L. Wear

December 1983 **Proceedings of the 15th conference on Winter simulation - Volume 1**

Full text available: pdf(734.88 KB) Additional Information: full citation, abstract, references, index terms

This paper describes how micro PASSIM, a GPSS based simulation system, was transported from the Apple II to the HP 9836. The problems associated with moving a large program form one UCSD Pascal system to another are discussed. Micro PASSIM was transported to the HP system so that an Ethernet to HPIB interface board could be modeled. The model is described and the results obtained from the simulation are discussed. A discussion of the advantages and disadvantages of using micro PASSIM rather ...

8 A Simulation Support System Capable Of Control, Monitoring And Simulation Of Airborne Systems

John C. Ostgaard

December 1978 **Proceedings of the 1978 annual conference**

Full text available: pdf(528.89 KB) Additional Information: full citation, abstract, references, index terms

With increasing use of simulations as a means of demonstrating and verifying systems, more emphasis has been placed on simulation support systems capable of sustaining these demonstrations. This paper contains a discussion of a current Support System used in conjunction with the Digital Avionics Information System (DAIS) Program being conducted at the Air Force Avionics Laboratory, Wright-Patterson Air Force Base. Descriptions of Support Hardware Systems and Software Support and ...

9 Simulating modular microcomputers

Frank J. Langley, Gerald A. LaGro, Joan Sheehan

March 1978 **Proceedings of the eleventh annual simulation symposium**

Full text available: pdf(1.47 MB) Additional Information: full citation, abstract, references, citings, index terms

The commitment of microprocessor-based system configurations to detailed logic design and breadboard fabrication traditionally results in a costly development cycle. This paper reports on the use of a computer design high-order-language (HOL) to simulate micro-computer functional elements, "macromodules", at the register level, and verify the timing and interface requirements for a family of microcomputer configurations. The definitions of these microcomputer macromodules (i. e. ...

10 Terrain database interoperability issues in training with distributed interactive simulation

Guy A. Schiavone, S. Sureshchandran, Kenneth C. Hardis

July 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 3

Full text available: pdf(443.34 KB) Additional Information: full citation, abstract, references, citings, index terms, review

In Distributed Interactive Simulation (DIS), each participating node is responsible for maintaining its own model of the synthetic environment. Problems may arise if significant inconsistencies are allowed to exist between these separate world views, resulting in unrealistic simulation results or negative training, and a corresponding degradation of interoperability in a DIS simulation exercise. In the DIS community, this is known as the simulator terrain database (TDB) correlation problem. ...

Keywords: distributed interactive simulation, terrain databases

11 Simulation experiments of a tree organized multicomputer

J. Archer Harris, David R. Smith

April 1979 **Proceedings f the 6th annual symposium on C mputer architecture**

Full text available: pdf(533.62 KB) Additional Information: full citation, abstract, references, citings, index terms

The paper describes the results of simulation experiments of a tree organized multicomputer now being constructed in the Department of Computer Science at Stony Brook. First the structure of the multicomputer is introduced. This is based on, (i) separate local memories, (ii) a tree organization mirrored on that of social structures, and (iii) a distributed file system. The simulation studies were designed to illuminate the performance of the multicomputer when cooperat ...

12 An architecture level simulation methodology

Paul D. Stigall, Ram Huggahalli

April 1991 **Proceedings of the 24th annual symposium on Simulation**

Full text available: pdf(1.24 MB) Additional Information: full citation, references, index terms

13 A local computer network simulation

John M. McCoy, Stewart L. French, Razmik Abnous, M. J. Niccolai

February 1981 **ACM SIGCSE Bulletin , Proceedings of the twelfth SIGCSE technical symposium on Computer science education**, Volume 13 Issue 1

Full text available: pdf(321.69 KB) Additional Information: full citation, abstract, references, index terms

Computer Networks are an important part of our society and they are quickly becoming an integral part of computer science basic curriculum. This paper describes the development of a computer simulation model for a local computer network and its use as a viable tool in computer science education.

Keywords: Computer network, Computer network simulation, Computer performance, Computer simulation, Local computer network, Modeling

14 Fast performance analysis of bus-based system-on-chip communication architectures

Kanishka Lahiri, Anand Raghunathan, Sujit Dey

November 1999 **Proceedings of the 1999 IEEE/ACM international conference on Computer-aided design**

Full text available: pdf(249.63 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper addresses the problem of efficient and accurate performance analysis to drive the exploration and design of bus-based System-on-Chip (SOC) communication architectures. Our technique fills a gap in existing techniques for system-level performance analysis, which are either too slow to use in an iterative communication architecture design framework (e.g., simulation of the complete system), or are not accurate enough to drive the design of the communication archite ...

15 pSNOW: a tool to evaluate architectural issues for NOW environments

Mangesh Kasbekar, Shailabh Nagar, Anand Sivasubramaniam

July 1997 **Pr ceedings f the 11th internati nal conference on Superc mputing**

Full text available: pdf(1.47 MB) Additional Information: full citation, references, citings, index terms

16 Operating systems projects built on a simple hardware simulator
John Dickinson
March 2000 **ACM SIGCSE Bulletin , Proceedings f the thirty-first SIGCSE technical symp sium n C mputer science educati n**, Volume 32 Issue 1
Full text available: pdf(408.12 KB) Additional Information: full citation, abstract, references, citings, index terms

Effective teaching of operating system concepts requires projects. This paper describes a series of operating system projects all based on a simple hardware simulator that have been used to teach operating system concepts at the undergraduate level. A key feature of this approach is the use of a simple but realistic hardware model upon which an operating system is progressively built. The hardware simulator evolves as the operating system evolves.

17 A parallel embedded-processor architecture for ATM reassembly
Richard F. Hobson, P. S. Wong
February 1999 **IEEE/ACM Transactions on Networking (TON)**, Volume 7 Issue 1
Full text available: pdf(331.21 KB) Additional Information: full citation, references, citings, index terms

Keywords: ATM, embedded systems, medium access control, segmentation and reassembly

18 Real time simulation of elevators
George T. Hummet, Thomas D. Moser, Bruce A. Powell
December 1978 **Proceedings of the 10th conference on Winter simulation - Volume 2**
Full text available: pdf(1.72 MB) Additional Information: full citation, abstract, references, citings, index terms

The principal transportation system in a highrise building is the elevator system. The performance of the system as perceived by the passengers can be measured by the time spent waiting for a car and smoothness of the ride. In turn, the waiting time is a very complex function of many variables: number of cars, car speed, number of floors served, passenger traffic, elevator dispatching strategy, etc. This paper discusses a recently developed minicomputer simulator, ELSIM, which simulates pas ...

19 Potential performance of parallel conservative simulation of VLSI circuits and systems
Mark Rawling, Rhys Francis, David Abramson
April 1992 **Proceedings of the 25th annual symposium on Simulation**
Full text available: pdf(1.12 MB) Additional Information: full citation, references, index terms

20 High-level architectural co-simulation using Esterel and C
Andre Chatelain, Yves Mathys, Giovanni Placido, Alberto La Rosa, Luciano Lavagno
April 2001 **Proceedings of the ninth international symposium on Hardware/software codesign**
Full text available: pdf(711.50 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper introduces an architectural simulation environment, aimed at defining the best SOC architecture for complex system-level applications. The application is modeled using an abstract Timing Modeling Language, that describes the requests (e.g., memory accesses,

I/Os, etc.) that the application makes to the architecture. The abstract architecture is modeled at the cycle-accurate level using a mixture of Esterel (a synchronous language) and C. We discuss the results of the application of ...

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1 An interim empirical evaluation of ECSS for computer system simulation development

Donald W. Kosy

June 1973 **Proceedings of the 1973 symposium on Simulation of computer systems**

Full text available: pdf(1.04 MB) Additional Information: full citation, abstract, references, citings, index terms

A recent experiment at Rand has provided quantitative data on the effect of using different languages for simulating computer systems. The experiment consisted of programming a small simulation of a hypothetical multiprogrammed computer in ECSS (the Extendable Computer System Simulator), a new experimental language specifically oriented toward simulating computer systems, and recording in detail the progress of program development. The purpose of the experiment was to determine to what exte ...

2 Towards "on the fly" performance models for conservative asynchronous protocols

Mary L. Bailey, Shane Walker

December 1994 **Proceedings of the 26th conference on Winter simulation**

Full text available: pdf(399.11 KB) Additional Information: full citation, references, index terms

3 The robustness of separable queueing network models

Charles E. Knadler

December 1991 **Proceedings of the 23rd conference on Winter simulation**

Full text available: pdf(720.12 KB) Additional Information: full citation, references, citings, index terms

4 Production and representation of computer system simulation models

Giuseppe G. Iazeolla, Enrico Martinelli, Orazio Tedone

August 1976 **Proceedings of the fourth symposium on Simulation of computer systems**

Full text available: pdf(534.73 KB) Additional Information: full citation, abstract, references, index terms

The problem of the production of computer systems simulation models is dealt with. The software production process is generally carried out without considering the performance aspects of the whole system: performance evaluation is generally made later, once the system has been implemented. In this paper the process of the development of a system simulation model which can be used to discover aspects of system behaviour before the

system is completely implemented is investigated. This proces ...

5 A program-driven simulation model of an MIMD multiprocessor
Fredrik Dahlgren
April 1991 **Pr ceedings f the 24th annual symposium on Simulation**
Full text available: pdf(1.01 MB) Additional Information: full citation, references, citings, index terms

6 On—line simulation
Malcolm M. Jones
January 1967 **Proceedings of the 1967 22nd national conference**
Full text available: pdf(869.66 KB) Additional Information: full citation, abstract, references, citings, index terms

An on-line simulation system allows both the user and the computer to cooperate and share the task of performing the simulation. It does this by providing facilities for the user to interact with the computer so that they may both play active roles in the simulation process as it is occurring. Thus, the user may perform some of the simulation functions himself and the computer performs the remaining ones. Alternately, the user may act only as a monitor and observe, verify and record data or ...

7 The automation of simulation
G. K. Hutchinson
December 1981 **Proceedings of the 13th conference on Winter simulation - Volume 2**
Full text available: pdf(484.20 KB) Additional Information: full citation, abstract, references, index terms

The principles of Computer Aided Design (CAD) have been incorporated in a simulation system to reduce the time and cost to produce simulations and expand the set of potential users to nonprogrammers. Computer Aided Programming for Simulation (CAPS) is an interactive program which queries the user and processes the responses to write a simulation program which, for models in its domain, is guaranteed to be logically correct and execute on the first run. CAPS is based upon the use of activity ...

8 A development methodology applied to a radar system simulation
Jane Harmon, Jay Landreth, Donald Lausch, Padman Nagenthiram, Henry Ramirez
December 1983 **Proceedings of the 15th conference on Winter Simulation - Volume 2**
Full text available: pdf(762.53 KB) Additional Information: full citation, abstract, references, index terms

As systems to be simulated grow larger and more complex and the cost of software escalates the need for cost and time efficient development methodologies become critical. This paper describes such a methodology. The methodology is based on standard modern software practices such as top-down design and structured programming. This development methodology has been applied to a radar system simulation which will eventually grow into an air defense simulation employing a surveillance net, and d ...

9 Automatic programming assistant for network simulation models
Fan T. Tseng, S. X. Zhang, John W. Wolfsberger
December 1988 **Proceedings of the 20th conference on Winter simulation**
Full text available: pdf(586.57 KB) Additional Information: full citation, abstract, references, index terms

This paper presents the development of a simulation tool to assist the modeler of prelaunch countdown sequences define the problem and then automatically write the corresponding code in the target simulation language GPSS/PC. Included in this paper are a description of the Automatic Network Programming System (ANPS) and a sample problem using ANPS.

10 S3, the System and Software Simulator

Leo J. Cohen

December 1968 **Proceedings f the second conference n Applicati ns f simulati ns**

Full text available: pdf(250.73 KB) Additional Information: full citation, abstract, citings, index terms

The System and Software Simulator (S3) is a computer program written entirely in Fortran IV and capable of execution on any computer having that compiler available. Thus far S3 has been applied to computer system simulation problems while executing on the Univac 1108 and the IBM system 360, models 50, 65, and 75. The purpose of S3 is threefold; in the first place it provides a convenient computer oriented language for the specification of the total hardware/software environment o ...

11 Execution-driven simulation of multiprocessors: address and timing analysis

S. Dwarkadas, J. R. Jump, J. B. Sinclair

October 1994 **ACM Transactions on Modeling and Computer Simulation (TOMACS),** Volume 4 Issue 4

Full text available: pdf(1.58 MB) Additional Information: full citation, abstract, references, citings, index terms

This article describes and evaluates an efficient execution-driven technique for the simulation of multiprocessors that includes the simulation of system memory and that is driven by real program work loads. The technique produces correctly interleaved address traces at run-time without disk access overhead or hardware support, allowing accurate simulation of the effects of a variety of architectural alternatives on programs. We have implemented a simulator based on this technique that offe ...

Keywords: distributed systems, execution-driven simulation, parallel tracing, shared-memory multiprocessors

12 SOLPASS - a Simulation Oriented Language Programming and Simulation System

James Armstrong, Horst Ulfers, Donald J. Miller, Harry C. Page

December 1969 **Proceedings of the third conference on Applications of simulation**

Full text available: pdf(950.75 KB) Additional Information: full citation, abstract, citings, index terms

SOL A Simulation Oriented Language, was described by Messrs. Knuth and McNeley of Burroughs Corp. in 1964. In 1968 a complete 2-pass compiler system was developed under Government contract by Messrs. Page and Miller of Patterson-Smith, Inc. Since then a number of features have been added to the SOL language, making it a very powerful tool for discrete simulations. SOLPASS has found a broad field of applications within the USAECOM Laboratories served by the Burroughs B5500 installation at Fo ...

13 The development of the General Purpose Simulation System (GPSS)

Geoffrey Gordon

March 1975 **The first ACM SIGPLAN conference on History of programming languages,** Volume 10 , 17 Issue 2 , 4

Full text available: pdf(1.75 MB) Additional Information: full citation, abstract, references, citings, index terms

The General Purpose Simulation System (GPSS) is a programming system designed for the simulation of discrete systems. These are systems that can be modeled as a series of state changes that occur instantaneously, usually over a period of time. Complexities in their analysis arise because there are many elements in the system, and there is competition for limited system resources. The simulation technique uses numerical computation methods to follow the system elements through their changes ...

14 Incremental system development of large discrete-event simulation models

Lars G. Randell, Lars G. Holst, Gunnar S. Bolmsjö
December 1999 **Proceedings f the 31st conference n Winter simulati n: Simulati n--- a bridge to the future - V lume 1**
Full text available: pdf(143.70 KB) Additional Information: full citation, references, citings, index terms

15 Models of memory scheduling
A. K. Agrawala, R. M. Bryant
November 1975 **Proceedings of the fifth ACM symposium on Operating systems principles**
Full text available: pdf(535.24 KB) Additional Information: full citation, abstract, references, citings, index terms

Queueing theoretic models of single and multi-processor computer systems have received wide attention in the computer science literature. Few of these models consider the effect of finite memory size of a machine and its impact on the memory scheduling problem. In an effort to formulate an analytical model for memory scheduling we propose four simple models and examine their characteristics using simulation. In this paper, we discuss some interesting results of these simulations.

Keywords: Analytical models, Computer system simulation, Dynamic memory allocation, First-fit, Memory fragmentation, Multiprogramming, Performance evaluation, Scheduling, Swapping systems

16 Adaptive memory management and optimism control in time warp
Samir R. Das, Richard M. Fujimoto
April 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 2
Full text available: pdf(321.66 KB) Additional Information: full citation, abstract, references, citings, index terms, review

It is widely believed that the Time Warp protocol for parallel discrete event simulation is prone to two potential problems: an excessive amount of wasted, rolled back computation resulting from "rollback thrashing" behaviors, and inefficient use of memory, leading to poor performance of virtual memory and/or multiprocessor cache systems. An adaptive mechanism is proposed based on the Cancelback memory management protocol for shared-memory multiprocessors that dynamically contro ...

17 Time warp simulation using time scale decomposition
Hany H. Ammar, Su Deng
April 1992 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 2 Issue 2
Full text available: pdf(1.25 MB) Additional Information: full citation, abstract, references, citings, index terms, review

In this paper we consider time scale decomposition as well as spatial decomposition to induce massive parallelism and reduce overhead in distributed discrete-event simulations. We confine our study to the Time Warp strategy and to systems where the durations of activities differ by several orders of magnitude (i.e., systems with fast and slow activities). We show that, for such systems, a large overhead due to rollbacks is encountered when spatial decomposition is used. Moreover, performanc ...

Keywords: fault-tolerant systems, parallel simulation, performability analysis, queueing networks, stochastic petri nets, system modeling, time-scale decompositions

18 Some experiments in simulating OS/360 from performance data
Leonard Bass, Thomas Santos, Michael Sheets
January 1974 **Pr ceedings f the 7th c nference n Winter simulati n - V lume 2**

Additional Information: full citation, abstract, references, index terms

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20 The approach to designing a future pharmaceutical manufacturing facility
Carol A. Park, Ty Getz
December 1992 **Proceedings of the 24th conference on Winter simulation**

Full text available: pdf(279.43 KB) Additional Information: full citation, citings, index terms

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1 Simulating modular microcomputers

Frank J. Langley, Gerald A. LaGro, Joan Sheehan

March 1978 **Proceedings of the eleventh annual simulation symposium**

Full text available: pdf(1.47 MB) Additional Information: full citation, abstract, references, citings, index terms

The commitment of microprocessor-based system configurations to detailed logic design and breadboard fabrication traditionally results in a costly development cycle. This paper reports on the use of a computer design high-order-language (HOL) to simulate micro-computer functional elements, "macromodules", at the register level, and verify the timing and interface requirements for a family of microcomputer configurations. The definitions of these microcomputer macromodules (i. e. ...

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Tom P. Vayda, Larry L. Wear

December 1983 **Proceedings of the 15th conference on Winter simulation - Volume 1**

Full text available: pdf(734.88 KB) Additional Information: full citation, abstract, references, index terms

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3 Computerized measurement of operator performance on simulators

Edward J. Kozinsky

January 1981 **Proceedings of the 13th conference on Winter simulation - Volume 1**

Full text available: pdf(360.50 KB) Additional Information: full citation, abstract, references, index terms

This computer-based system aids in evaluating operator's performance on a power plant simulator. The Performance Measurement System (PMS) helps the instructor in his total evaluation by providing objective measurements and documentation of operator reaction time, sequence of manipulation, and extent of parametric control. These measurements can also apply to Human Factors research on the operator-control room interface.

4 Real time simulation of elevators

George T. Hummet, Thomas D. Moser, Bruce A. Powell
December 1978 **Pr ceedings of the 10th conference n Winter simulati n - V lume 2**

Full text available: pdf(1.72 MB) Additional Information: full citation, abstract, references, citings, index terms

The principal transportation system in a highrise building is the elevator system. The performance of the system as perceived by the passengers can be measured by the time spent waiting for a car and smoothness of the ride. In turn, the waiting time is a very complex function of many variables: number of cars, car speed, number of floors served, passenger traffic, elevator dispatching strategy, etc. This paper discusses a recently developed minicomputer simulator, ELSIM, which simulates pas ...

5 A distributed approach to queueing network simulation
J. Kent Peacock, J. W. Wong, Eric Manning
December 1979 **Proceedings of the 11th conference on Winter simulation - Volume 2**

Full text available: pdf(641.23 KB) Additional Information: full citation, abstract, references, citings, index terms

Discrete simulation is a widely used technique for system performance evaluation. The conventional approach to discrete simulation (e.g., GPSS, Simscript) does not attempt to exploit the parallelism typically available in queueing network models. In this paper, a distributed approach to discrete simulation is presented. It involves the decomposition of a simulation into components and the synchronization of these components by message passing. This approach can result in the speedup of the ...

6 Evaluating the performance of a unified switching node using a simulated network
Kenneth J. Bodzioch, Bernard E. Patrusky
December 1976 **Proceedings of the 76 Bicentennial conference on Winter simulation**

Full text available: pdf(750.45 KB) Additional Information: full citation, abstract, references, index terms

This paper describes a program which utilizes a discrete event simulation to drive a real switching node. Empirical measurements of various nodal performance characteristics are gathered and recorded during the exercise of this program to aid in the evaluation and design of candidate future nodal architectures. Applications software and specialized hardware for a unified node which switches both digitized voice and data (packet) traffic were developed and tested in a flexible tes ...

7 Design and implementation of a flexible and interactive microprogram simulator
M. Mezzalama, P. Prinetto
November 1979 **Proceedings of the 12th annual workshop on Microprogramming**

Full text available: pdf(513.00 KB) Additional Information: full citation, abstract, references, citings, index terms

In the present paper a microprogrammable architecture oriented simulator is described. This simulator structure may be logically subdivided in four independent blocks: Supervisor, Interface Module, Simulation Monitor, Simulation Routines. A high degree of flexibility is obtained by means of a highly hierarchical structure of software and an easy-to-modify table-driven system description. Moreover particular care has been devoted to user-simulator communication via an easy-to-use ...

8 A methodology for simulating computer systems
Peter L. Haigh
March 1982 **Pr ceedings f the fifteenth annual simulation symp sium**

Full text available: pdf(1.86 MB) Additional Information: full citation, abstract, references, index terms

Simulation languages, while providing the modeler with the essential tools for model

development, do not provide well defined philosophies for modeling specific classes of systems. Although some languages strongly suggest a particular modeling approach, deriving from a particular world view, a methodology must be developed by the practitioner. A methodology for developing simulation models of computer systems is discussed. In all computer systems there are universal processes which may be b ...

9 Simulation and verification: Efficient simulation of synthesis-oriented system level designs

Nick Savoiu, Sandeep K. Shukla, Rajesh K. Gupta
October 2002 **Proceedings of the 15th international symposium on System Synthesis**

Full text available: pdf(314.66 KB) Additional Information: full citation, abstract, references, index terms

Modeling for synthesis and modeling for simulation seem to be two competing goals in the context of C++-based modeling frameworks. One of the reasons is while most hardware systems have some inherent parallelism efficiently expressing it depends on whether the target usage is synthesis or simulation. For synthesis, designs are usually described with synthesis tools in mind and are therefore partitioned according to the targeted hardware units. For simulation, runtime efficiency is critical but o ...

Keywords: SystemC, simulation, system-level design

10 Simulation education: A crowd of little man computers: visual computer simulator teaching tools

William Yurcik, Hugh Osborne
December 2001 **Proceedings of the 33nd conference on Winter simulation**

Full text available: pdf(437.82 KB) Additional Information: full citation, abstract, references, citings

This paper describes the use of a particular type of computer simulator as a tool for teaching computer architecture. The Little Man Computer (LMC) paradigm was developed by Stuart Madnick of MIT in the 1960s and has stood the test of time as a conceptual device that helps students understand the basics of how a computer works. With the success of the LMC paradigm, LMC simulators have also proliferated. We compare and contrast the current crowd of LMC simulators highlighting visual features. We ...

11 SWiMNet: a scalable parallel simulation testbed for wireless and mobile networks

Azzedine Boukerche, Sajal K. Das, Alessandro Fabbri
September 2001 **Wireless Networks**, Volume 7 Issue 5

Full text available: pdf(397.98 KB) Additional Information: full citation, abstract, references, index terms

We present a framework, called SWiMNet, for parallel simulation of wireless and mobile PCS networks, which allows realistic and detailed modeling of mobility, call traffic, and PCS network deployment. SWiMNet is based upon event precomputation and a combination of optimistic and conservative synchronization mechanisms. Event precomputation is the result of model independence within the global PCS network. Low percentage of blocked calls typical for PCS networks is exploited in the channel alloca ...

Keywords: PCS network models, framework for PCS network simulation, parallel discrete event simulation, performance analysis

12 Toward real time simulation: prototyping of a large scale parallel ground target simulation

John B. Gilmer, David W. O'Brien, Jeffery E. Payne
December 1990 **Pr ceedings f the 22nd c nference on Winter simulation**

Full text available: pdf(878.73 KB) Additional Information: full citation, references, citings, index terms

13 HAL II: a mixed level hardware logic simulation system
Shigeru Takasaki, Tohru Sasaki, Nobuyoshi Nomizu, Hiroshi Ishikura, Nobuhiko Koike
July 1986 **Proceedings of the 23rd ACM/IEEE conference on Design automation**

Full text available: pdf(678.52 KB) Additional Information: full citation, abstract, references, citings, index terms

This paper describes a mixed level hardware logic simulation system, called Hardware Logic Simulator II (HAL II). This paper first shows a HAL II simulation method. Then, it overviews HAL II hardware and software system configurations, simulation mechanism and estimates system performance. The HAL II system can handle a maximum of 5.8 million gates and a high level design language FDL (Functional Description Language). Finally, it discusses system applications and results. The paper also in ...

14 Exploiting model independence for parallel PCS network simulation
Azzedine Boukerche, Sajal K. Das, Alessandro Fabbri, Oktay Yildiz
May 1999 **Proceedings of the thirteenth workshop on Parallel and distributed simulation**

Full text available: pdf(688.35 KB) Publisher Site Additional Information: full citation, abstract, references, citings, index terms

In this paper, we present a parallel simulator (SWiMNet) for PCS networks using a combination of optimistic and conservative paradigms. The proposed methodology exploits event precomputation permitted by model independence within the PCS components. The low percentage of blocked calls is exploited in the channel allocation simulation of precomputed events by means of an optimistic approach. %To illustrate and verify the developed approach, Experiments were conducted with various call arrival rat ...

15 An architecture level simulation methodology
Paul D. Stigall, Ram Huggahalli
April 1991 **Proceedings of the 24th annual symposium on Simulation**

Full text available: pdf(1.24 MB) Additional Information: full citation, references, index terms

16 Dynamic memory usage in parallel simulation: a case study of a large-scale military logistics application
Chris J. M. Booth, David I. Bruce, Peter R. Hoare, Michael J. Kirton, K. Roy Milner, Ian J. Relf
November 1996 **Proceedings of the 28th conference on Winter simulation**

Full text available: pdf(743.98 KB) Additional Information: full citation, references

17 Using the SimOS machine simulator to study complex computer systems
Mendel Rosenblum, Edouard Bugnion, Scott Devine, Stephen A. Herrod
January 1997 **ACM Transactions on Modeling and Computer Simulation (TOMACS)**, Volume 7 Issue 1

Full text available: pdf(731.76 KB) Additional Information: full citation, references, citings, index terms, review

Keywords: computer architecture, computer simulation, computer system performance analysis, operating systems

18 A comparison of methods for simulating computer bus architectures

Larry Wear

January 1981 **Proceedings of the 13th conference on Winter simulation - Volume 1**

Full text available: pdf(389.90 KB) Additional Information: full citation, abstract, references, index terms

This paper describes three methods that were used to investigate multiprocessor bus architectures. The models described were implemented in FORTRAN, GPSS, and SIMULA. Characteristics of the three implementations, such as program length, program memory requirements, execution time and ease of use are compared. Results of the simulation of a single bus system are presented to show how the various parameters affect system performance.

19 Modeling and simulation in product development

Douglas G. Boike, Edward H. Ernst

March 1982 **Proceedings of the fifteenth annual simulation symposium**

Full text available: pdf(401.24 KB) Additional Information: full citation, abstract, index terms

As part of the product development cycle, the Xerox Corporation has evolved a modeling and simulation methodology. This paper describes the approach, its use, and value in product development. To provide a common basis for understanding the modeling activities to be discussed, a brief overview of the xerographic process as used in our current duplicator copier products is described. Each of the functions is discussed in terms of how they contribute to the overall systems model and how they ...

20 Simulation experiments of a tree organized multicomputer

J. Archer Harris, David R. Smith

April 1979 **Proceedings of the 6th annual symposium on Computer architecture**

Full text available: pdf(533.62 KB) Additional Information: full citation, abstract, references, citings, index terms

The paper describes the results of simulation experiments of a tree organized multicomputer now being constructed in the Department of Computer Science at Stony Brook. First the structure of the multicomputer is introduced. This is based on, (i) separate local memories, (ii) a tree organization mirrored on that of social structures, and (iii) a distributed file system. The simulation studies were designed to illuminate the performance of the multicomputer when cooperat ...

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